

REPORT ON THE MAMMALIA COLLECTED BY MR. EDMUND HELLER DURING THE PERUVIAN EXPEDITION OF 1915 UNDER THE AUSPICES OF YALE UNIVERSITY AND THE NATIONAL GEOGRAPHIC SOCIETY.

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In 1912 and succeeding years an expedition was organized under the auspices of Yale University and the American National Geographic Society for the exploration of the deserted Inca city Machu Picchu, in the Cuzco region of Peru. To the 1915 staff of the expedition there was attached, as zoological collector, Mr. Edmund Heller, already so well known for his work in California and British East Africa, and it is on the result of his labors round Machu Picchu that the following paper is based. The collection has been placed in my hands by the authorities of the United States National Museum, at the kind suggestion of Mr. Gerrit S. Miller.<sup>1</sup> Thanks to my interest for many years in the mammal fauna of the region, its examination has been a very great pleasure to me, and I must express my acknowledgments to those to whom I owe the privilege of working it out.

An account of Machu Picchu and the highly successful expedition of 1912 for its discovery and exploration is given by Prof. Hiram

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<sup>1</sup> The Peruvian mammals were sent to Mr. Thomas in July and December, 1916, a time when the German submarine campaign made transportation sufficiently dangerous to warrant the retaining of a reserve series in Washington. With the assistance of Mr. N. Hollister I therefore divided the collection into two parts, one of which was to be forwarded to London and the other to be kept here. Our system in picking out the two sets was as follows: The various groups were divided into as many forms as appeared to be obviously or possibly distinct. Of each of these forms at least one specimen from every locality represented was placed in the first set. Moderately large series were divided about evenly between the two, but in the case of very extensive series the first set received not more than a representative lot of specimens. The material which forms the basis of this paper, though it numbers only 614 specimens out of a total of 892, is supposed to represent every mammal obtained by Mr. Heller. While it is unfortunate that it was necessary to divide the collection in this way, there is little probability that any forms not included in the first set were retained in the second. At the time of making the division we thought that the entire number represented by the material sent to London was slightly above 70; but only 65 were identified by Mr. Thomas. The lists of specimens here published are limited to the first set. The photographs reproduced in plates 14 and 15 show the skulls of all of the type specimens in the collection. They were made under my supervision after the material had been returned.—G. S. M., jr.

Bingham in the National Geographic Magazine,<sup>1</sup> with illustrations which show well the physical characters, the mighty mountains, and stupendous river valleys of the region where the collection was made. Machu Picchu is itself on the Urubamba River, some 45 miles northwest of Cuzco; and while it was being explored by the archaeologists of the party, Mr. Heller made collecting trips in different directions from it, so that the area over which the mammal collection was made extends from the Rio Comerciato, about 65 miles northwest of Machu Picchu to Pucara, close to Cuzco, all the places being in the drainage system of the Urubamba. A small number of specimens were also got at La Raya Pass, 100 miles southeast of Cuzco, on the watershed dividing the upper Urubamba from the Upper Pucara, which runs southeastward to Lake Titicaca. The exact positions of most of the localities are shown in Professor Bingham's map.

Considering its remoteness from civilized regions and the immense difficulties involved in making collections in such a place, it is certain that only a large and well-equipped expedition, such as that under the direction of Professor Bingham, could have provided an opportunity for a collector to have obtained anything like a complete series of the mammals of this area.

The collection consists of nearly a thousand specimens of all orders, but it is chiefly rich in Muridae, which Mr. Heller was extremely successful in capturing. In all it contains 65 species, of which I have found it necessary to describe 12 as new. Short diagnoses of all but one of these have been already published.<sup>2</sup> Of the novelties, by far the most interesting is a new Marsupial nearly related to *Coenolestes*, but sufficiently distinct to be regarded as a different genus. Members of the family were previously known from Colombia and Ecuador, so that the present is a considerable extension of the recent range of the group.

Within the area now dealt with, of which the crossing of 13° S. with 72° 30' W. may be taken as the center, almost no collections of mammals have been made, a couple of small series sent to the British Museum by O. Garlepp in 1898 and 1903, and a few odd specimens, also in the British Museum, obtained by the Polish collector J. Kalinowski, appearing to be all that are recorded, although there may be a few others which I do not know of. In order to make the present list as complete as possible I have included in it the specimens of the Garlepp and Kalinowski collections, so that it contains all the species as yet known from the area. Near-by regions are, however, more richly represented, notably the district of Junin, where both

<sup>1</sup> In the Wonderland of Peru, by Hiram Bingham, Nat. Geogr. Mag., vol. 24, p. 387, April, 1913.

<sup>2</sup> Smithsonian Miscel. Coll., vol. 68, No. 4, April 10, 1917.

Jelski and Kalinowski worked, and localities on the Rio Perené and Rio Inambari, where that fine collector, P. O. Simons, secured for us the first Peruvian series ever made in modern fashion. The last named also went to many other localities in Peru and Bolivia, and the majority of the species I have described were discovered by him. The only other modern Peruvian collection of importance is that recently made in the northwest by Messrs. Osgood and Anderson, and worked out by the former in 1913 and 1914. None of these collections, however, is anything like so complete a representative of its locality as the present one, which probably surpasses any other ever made in South America. Mr. Simons moved about too much to have worked any one locality as well; Messrs. Osgood and Anderson were merely passing through; while no one else of equally trained ability has entered the country.

The following is a list of faunal publications relating to the mammals of Peru, but of course much if not most of the literature is in the form of scattered observations on the different animals:

1844-1846. TSCHUDI, J. J. von. *Fauna Peruana. Mammalia*, pp. 1-262. In an effort to make it appear complete the accounts of the species in this work have been made so generalized as to deprive them of much of their value. This is notably the case with the geographical distributions, which even in the case of rare species are usually in quite general terms, without mention of particular localities.

1882. THOMAS, O. On a collection of Rodents from N. Peru. [Coll. J. Stolzmann.] *Proc. Zool. Soc. London*, 1882, p. 98. Tumbes, Cajamarca, etc.

1884. ———. On a collection of Muridae from Central Peru. [Coll. C. Jelski.] *Proc. Zool. Soc. London*, 1884, p. 447. Junin region.

1893. ———. On some mammals from Central Peru. [Coll. J. Kalinowski.] *Proc. Zool. Soc. London*, 1893, p. 333. Chanchamayo and neighborhood.

1897. ALLEN, J. A. On a small collection of Mammals from Peru. [Coll. O. T. Baron.] *Bull. Amer. Mus. Nat. Hist.*, vol. 9, p. 115, 1897. Cajabamba, North Peru, and neighborhood.

1899. THOMAS, O. On some small mammals from the district of Cuzco, Peru. [Coll. O. Harlepp.] *Ann. and Mag. Nat. Hist.*, ser. 7, vol. 3, p. 40, 1899.

1900. ALLEN, J. A. On Mammals collected in Southeastern Peru by Mr. H. H. Keays. *Bull. Amer. Mus. Nat. Hist.*, vol. 13, p. 219, 1900. Inambari River.

1901. THOMAS, O. New Mammals from Peru and Bolivia, with a list of those recorded from the Inambari River. [Coll. P. O. Simons and others.] *Ann. and Mag. Nat. Hist.*, ser. 7, vol. 7, p. 178, 1901.

1902. ———. On Mammals from Cochabamba, Bolivia, and the region north of that place. [Coll. P. O. Simons.] *Ann. and Mag. Nat. Hist.*, ser. 7, vol. 9, p. 125, 1902. Many of these Bolivian species range into the Cuzco region.

1913. OSGOOD, W. H. New Peruvian Mammals. [Coll. W. H. Osgood and M. P. Anderson.] *Field Mus. Nat. Hist. Publ.*, vol. 10, p. 95, 1913. Moyobamba, Cajamarca, etc.

1914. ———. Mammals of an Expedition across North Peru. *Field Mus. Nat. Hist. Publ.*, vol. 10, p. 145, 1914. Moyobamba route.

1916. ———. Mammals of the Collins-Day South American Expedition. [Coll. G. K. Cherrie and R. H. Becker.] *Field Mus. Nat. Hist. Publ.*, vol. 10,

p. 199, 1916. Mostly relating to Bolivia and the Amazons, but a few specimens recorded from the Peruvian plateau.

No specimens were obtained by Mr. Heller of the two rodents described by Mr. Eaton, the osteologist of the party, on skulls found by him in the Inca tombs of Machu Picchu during the 1912 expedition, *Abrocoma oblativa* and *Agouti thomasi*;<sup>1</sup> nor of *Lagostomus crassus* described by myself in 1910<sup>2</sup> on a skull found in the sand at Santa Ana by Mr. Kalinowski. The first and third of these animals are in all probability now completely extinct, judging by the fact that their relatives are no longer found in this faunal area, but only far south in Chile and Argentina. On the other hand, the second species, which is closely allied to living Andean forms, will perhaps be found still to exist in the neighborhood.

Finally, I must express by acknowledgements to Miss Winifred Davidson for the assistance she has given me in sorting, handling, and labeling the large series of specimens, an assistance which has materially eased the labor of preparing the present report.

#### 1. ATELES ATER F. Cuvier.

Adult and young female, Nos. 194337 and 194339, Rio Comerciato (3,000 feet).

An adult specimen in the British Museum from Pachitea, determined by Doctor Eliot, is very similar to these.

#### 2. ALOUATTA SENICULUS Linnaeus.

Three males and one female, Nos. 194349, 194352, 194353, and 194354, Rio Comerciato (2,000–3,000 feet).

#### 3. CEBUS UNICOLOR CUSCINUS Thomas.

Male and female, Nos. 194356 and 194357, Uvini, Rio Cosireni (5,000 feet).

[Female, No. 98.11.6.1, B. M., Callanga, Cuzco. O. Farlepp. Type.]

These two specimens of the Cuzco *Cebus* agree in every detail with the type and confirm its distinction as a local form. I accept for the moment its relation with *unicolor*, as advocated by Doctor Elliot, who appeared doubtful of its validity, owing to its being based on a single example. Mr. Heller's specimens are therefore of interest as tending to resolve the doubt in the matter.

The greatest skull length of the male (not fully adult) is 95 mm.; of the female (old), 90 mm.

<sup>1</sup> Mem. Conn. Acad., vol. 5, p. 87, 1916.

<sup>2</sup> Ann. and Mag. Nat. Hist., ser. 8, vol. 5, p. 246, 1910.



[*CEBUS AZARAE PALLIDUS* Gray.]

[Three males and one female, Nos. 97.10.3.4-7, B. M., Idma, Santa Ana, Cuzco. J. Kalinowski.]

The association with *azarae* is accepted on the authority of Doctor Elliot.<sup>1</sup> I had already referred the specimens to Gray's *pallidus*.

4. *LAGOTHRIX THOMASI* Elliot.

Young male, No. 194343, Rio Comerciato (2,000 feet).

[Female, No. 98.11.6.2, B. M., Callanga, Cuzco (5,000 feet). O. Garlepp. Type.]

No. 194343 of the present collection is quite young, so that it can not be determined with any certainty. It may perhaps be referable to the Cuzco form described by Doctor Elliot as *L. thomasi*.

5. *SAIMIRI BOLIVIENSIS NIGRICEPS* Thomas.

Three males and one female, Nos. 194344-7, Rio Comerciato (2,000 feet).

These specimens, and others recently received, confirm Doctor Elliot's observation that *nigriceps* may be distinguished from *boliviensis* by the deeper and more golden orange color of the forearms and feet, the tone in *boliviensis* being more yellowish. On the other hand, the intensity of the blackness of the cap, on which I primarily distinguished the subspecies, proves to be subject to considerable change with age, the older specimens having this a deeper black than the younger. Besides the type from Cosnipata, examples of *nigriceps* are in the British Museum collection from Marcapata (Kalinowski) and Tahua Manu River (Maj. H. S. Toppin).

6. *LEONTOCEBUS PURILLUS* Thomas.

Four specimens as follows:

Rio Cosireni, 3,000 feet, male and female, Nos. 194331, 194334.

Rio San Miguel, 4,500 feet, male and female, Nos. 194335-6.

These four specimens agree remarkably well with the type of *L. purillus*, which came from the Acre River, Upper Purus River, some 200 miles northeast of the present locality.

In the description, which was based on a single specimen that had been in confinement, emphasis was laid on the amount of ferruginous at the base of the tail, and on the buffy suffusion of the dorsal marbling; but both these characters prove to be variable on the evidence of Mr. Heller's specimens. On the other hand, the latter show one very well marked characteristic of the species which was not readily perceptible on the menagerie-soiled type—namely the white V-shaped frontal patch, extending the white of the muzzle backwards on each

<sup>1</sup> Primates, vol. 2, p. 108.

side over the eyes, a little suggesting the V-shaped eyebrows of the conventional pictures of Mephistopheles, done in white instead of black.

[MYOTIS NIGRICANS Wied.]

Six specimens in the British Museum, as follows:

Santa Ana, Nos. 97.10.3.20-21. J. Kalinowski.

Callanga, Cuzco, Nos. 98.11.6.3-5. O. Garlepp.

Marcapata, Cuzo, No. 3.2.9.1. O. Garlepp.

7. PEROPTERYX CANINA Wied.

One specimen in alcohol, Machu Picchu, No. 195118, is too much damaged for certain determination.

8. MOLOSSUS OBSCURUS Geoffroy.

Two specimens in alcohol, Santa Ana, Nos. 195173-4.

9. TADARIDA BRASILIENSIS Geoffroy.

Thirty-two specimens, as follows:

Machu Picchu, 6,000 feet, 3 (Nos. 194440-2).

Santa Ana, 3,500 feet, 29 (Nos. 194443-8, also 23 in alcohol not individually listed). Taken under tiles of roof.

10. GLOSSOPHAGA SORICINA Pallas.

Three specimens, as follows:

Santa Ana, 1 (No. 195125, in alcohol).

Idma, 6,000 feet, 2 (Nos. 194455 and 195126). No. 194455 was taken inside of a house. It contained one embryo.

11. ANOURA GEOFFROYI Gray.

Male, No. 195127, Ollantaytambo.

Represents Tschudi's *Choeronycteris peruana*.

12. PHYLLOSTOMUS HASTATUS Pallas.

Five specimens from Comerciato, 1,800 feet (Nos. 194460-4).

13. HEMIDERMA CASTANEUM H. Allen.

Seven specimens from Idma, 6,000 feet (Nos. 194436-9, also three in alcohol).

Quite similar to specimens obtained in Ecuador by G. Hammond, submitted to Mr. Gerrit Miller, by whom they were pronounced to be identical with *H. castaneum*, and compared with the common *H. perspicillatum*.

The species is distinguished both by its smaller skull and by the smaller size of the teeth, which are, however, remarkably variable, scarcely any two of the specimens agreeing in all details of the dentition.

No. 194438 is also anomalous in having its two upper posterior molars represented by a single one only, this being approximately of the shape of the normal last molar.

[*STURNIRA LILIUM* Geoffroy.]

[One specimen in the British Museum from Ocobamba, Cuzco. No. 98.11.6.6. O. Garlepp.]

14. *DESMODUS ROTUNDUS* Geoffroy.

Eleven specimens from Puquiura, 9,500 feet. (Nos. 194456-9; also seven in alcohol.)

15. *FELIS PUMA* Molina.

Male, No. 194310, Piscocucho, 8,700 feet. Condylbasal length of skull, 192 mm.

16. *FELIS PARDALIS* Linnaeus.

Male, No. 194311, Santa Ana.

17. *PSEUDALOPEX CULPAEUS ANDINA* Thomas.

Two specimens, as follows:

Paccaritampu, 1 (male, No. 194312).

Ocobamba Valley, 1 (male, No. 194313).

The Ocobamba specimen is a fine example in full winter pelage and agrees in all respects with the typical series. That from Paccaritampu is in poorer fur, and is rather smaller than usual. The skulls measure 159 and 148 mm. in condylbasal length, respectively.

18. *POTOS FLAVUS* Schreber.

Female, No. 194317, Uvini, Cosireni River (4,000 feet). Stomach contained figs.

This is the most southern locality from which the Kinkajou has been obtained, the nearest to it being Pozuzo, whence a pair is now in the British Museum. The specimen has a well-marked dorsal streak, and its skull measures 77.5 mm. in condylbasal length.

19. *BASSARICYON ALLENI* Thomas.

Adult and young female, Nos. 194315 and 194316, Rio Cosireni (3,000 feet). Stomach contained fruit and green vegetable pulp.

Except that the skull of the adult is slightly larger (condylbasal length, 79.5 mm.) these specimens agree absolutely with the Ecuadorian and Peruvian examples of *B. alleni* in the British Museum, having the same fulvous color, grayish face, and flattened frontal region of the skull.

The localities now represented for the species are Sarayacu and Gualaquiza, Ecuador (Buckley and Hammond). Pozuzo, Chanchamayo, and Rio Cosireni, Peru, (Egg, Schunke, and Heller).

A *Bassaricyon* from Munduapo, on the Orinoco, collected by J. K. Cherrie, appears to be referable to *B. medius* Thomas.

20. *MUSTELA AUREOVENTRIS* Gray.

Three specimens from Ollantaytambo, 9,000 feet (male No. 194326, female No. 194327 and an unsexed specimen, No. 194328).

[Male from Ocobamba, Cuzco, No. 98.11.6.1, B. M., O. Garlepp.]

Following Doctor Allen<sup>1</sup> I accept the identity of this dark-headed, yellow-bellied stoat with the species from Ecuador and Northern Peru, for which he uses Taczanowski's name *macrura*. But whether it is really distinct from the white or gray-bellied *M. agilis* of Tschudi appears to me doubtful in view of the considerable variability in color found in this group. An example from Lima, sent to England by the late Professor Nation, which I provisionally refer to Tschudi's species, has a practically white under surface and well-marked facial bands.

The name *aureoventris* is not invalidated by the earlier *auriventer* of Hodgson, as, apart from "one-letterist" differences, its first half comes from the adjective *aureus*, while Hodgson's name is based on the substantive *aurum*, so that not only the spellings but the derivations are different.

21. *CONEPATUS AREQUIPAE* Thomas.

Seven specimens, as follows:

Chospyoc, two males (Nos. 194321-2).

Urca, near Calca, female (No. 194324).

Machu Picchu, male (No. 194323).

Ocobamba Valley, two males (Nos. 194318-9) and one female (No. 194320).

These specimens confirm what I said in 1902 as to the difficulty of a proper determination of the members of *Conepatus*, and the probability that most of the forms would be found to grade into each other. Specimens from any given region have a generally similar facies, but almost every character varies individually, so that a diagnosis which shall cover every example is almost an impossibility. The present series all agree in having a long coarse coat and very broad white stripes, which are connected on the crown, the first character distinguishing them from *C. zorrino* and the second from *C. inca*. But in the reversal or nonreversal of the nape hairs, the separation or partial junction of the white stripes on the withers and the extension of the stripes down the back, there is considerable variation among them. In two out of the three Ocobamba Valley specimens the stripes even reach to the base of the tail, a character which I had hitherto

<sup>1</sup> Bull. Amer. Mus. Nat. Hist., vol. 35, p. 101, 1916.

believed to be one of those that distinguished the Chilean skunk, *C. chinga*, from all the forms of Peru and Bolivia.

With regard to nomenclature all may for the present bear the name *C. arequipae*, the type of which falls obviously into the same series, while *C. chorensis* (now that we know that the direction of the nape hairs is not a trustworthy character) and *C. porcinus* (if any mistake has been made as to the sexing of the type) may have to be united with the same animal. But the male skull of *C. chorensis* is a little smaller than that of *arequipae*.

The largest male skull of the present series, No. 194319, measures 83.2 mm. in condylobasal length.

## 22. *LUTRA EMERITA* Thomas (or *COLOMBIANA* Allen).

Female, No. 194325, Rio Comerciato (2,000 feet). Contained two small embryos.

Allowing for the sexual difference in the size of the skull, this specimen agrees remarkably well, especially in the shape of its nose pad, with the type of *L. emerita*, which may, however, prove to be synonymous with Allen's *L. colombiana*, a species I overlooked when writing my notes on South American otters in 1908.<sup>1</sup> The species would therefore seem to range all the way down the Andean chain on its eastern slope.

On the other hand, from quite near the present locality, the two examples of *L. incarum* Thomas, as explained in the original description, both show the form of the nose pad found in *L. platensis*, so that we have here otters with both types of nose pad occurring in the same locality. Whether the value of the character needs revision only much further material will show.

Another otter with the *emerita* type of nose pad is the South Chilean *L. provocax*, whose northward extension we do not yet know. There has been some doubt about the name of this animal, as it is certainly the species called *Lutra huidobria* by Gray and others, who based their use of the name on Molina's "*Castor huidobrius*." But I am not prepared to recognize as an otter a species described as having long rodent incisors and unpalmed forefeet, and think that in view of the insoluble mixture of local names, habits, and characters contained in Molina's description the name *Castor huidobrius* should be set aside as indeterminable.

<sup>1</sup>After its return from London I submitted this otter to Dr. J. A. Allen for comparison with *Lutra colombiana*. He writes as follows (Dec. 5, 1919): "I have carefully compared the skin and skull of the otter from Peru with the type and two other specimens of my *Lutra colombiana*. There are no appreciable external differences, but the skull is slightly larger and more heavily built, with noticeably stouter teeth; also the pterygoid fossa is slightly longer and narrower. The Peruvian form should probably be considered as subspecifically separable from *colombiana*. The specimens I have been able to compare are all females and of about the same age as the Peruvian specimen."—G. S. M., jr.

## 23. TREMARCTOS ORNATUS F. Cuvier.

Female, No. 194309, Machu Picchu.

The skull of this bear corresponds closely with those from Cosnipata, Inambari, which I used for comparison in giving a name to the Ecuador *T. o. majori*. It is 191 mm. in condylobasal length by 128 mm. in zygomatic breadth. The two upper molars together measure 37 mm.

The skin presents a good example of the uselessness of the "spectacles" as a distinctive character, for it has a light supraorbital line on one side and not on the other.

## 24. SCIURUS CASTUS Thomas.

Female, No. 194486, Rio Combarciato (2,000 feet).

## 25. SCIURUS CUSCINUS Thomas.

Female, No. 194487, Rio Combarciato (2,000 feet).

Two females from San Fernando, Rio San Miguel, 4,000 feet (Nos. 194488-9).

[Two, Nos. 98.11.6.8-9., B. M. (No. 8 the type), from Ocobamba. O. Garlepp.]

[Three, Nos. 3.2.9.3-5., from Marcapata. O. Garlepp.]

## 26. MUS MUSCULUS Linnaeus.

Eleven specimens, as follows:

Huaracondo, Cuzco, 2 (Nos. 194502-194765).

Chospyoc, 10,000 feet, 2 (Nos. 194503, 194905).

Ollantaytambo, 9,400 feet, 5 (Nos. 194504-5, 194508-10).

Idma, 6,000 feet, 2 (Nos. 194513-4).

## HOLOCHILUS INCARUM, new species.

A medium-sized species related to *H. sciureus*, but less buffy on flanks.

Size apparently about as in *H. sciureus*, but no adult female available for examination. General color above umber brown, not markedly more buffy on the flanks. Under surface slaty, washed with buffy, the hairs on a small patch on the throat white to their roots, but everywhere else broadly slaty at base, cinnamon buff terminally. Ears small, hairy, not darker than the general color of the head. Upper surface of hands and feet, buffy whitish. Tail about the length of the head and body, thinly haired, brown, rather lighter at base below.

Skull (pl. 14, fig. 1) not heavily ridged, but the only skull available is immature. Teeth comparatively small, as is usual in the Amazonian forms of *Holochilus*.

Dimensions of type, measured in the flesh by Mr. Erdis:



Head and body, 128; tail, 132; hindfoot (with claws), 36 (34 without claws on the dried skin). The hindfoot of No. 194917 measures 36 mm. (without claws), dried. Skull of type (immature); greatest length, 34; condylo-incisive length, 31; nasals, 14; palatilar length, 29; palatal foramina, 6.2; upper molar series, 7.2.

*Type*.—Immature female, from Santa Ana, U.S.N.M. No. 194915. Original No. 581. Collected December 22, 1914, by E. C. Erdis.

*Specimens examined*.—Male and two females from Santa Ana, 3,480 feet (Nos. 194917, 194915, 194919).

While a half-grown *Holochilus* from the Ucayali at the mouth of the Pachitea (alt. 440 feet), collected by Garlepp in 1903, is so exactly like equally immature specimens of *H. sciureus* that I see no reason to distinguish it, these specimens, from altitudes over 3,000 feet, are so uniformly without the marked wash of buffy on the flanks characteristic of that animal that they should apparently have a special name.

Unfortunately the material is somewhat imperfect, as neither 194917 nor 194919 has a skull, while the type is decidedly immature.

The Pachitea specimen, like those of the lower Amazon, has a well-marked buffy wash along the flanks, and it is not improbable that from Peru, at a comparatively low altitude, right down the Amazon to Para and Pernambuco, only one species of the genus is found, a distribution not impossible in so water-loving an animal. I confess now to considerable doubt as to whether *H. guianae* ought to have been separated from *H. sciureus*—a doubt which also applies to *H. amazonicus*.

The N. Peruvian *Holochilus* obtained by Mr. Osgood in 1912, also immature, is presumably the same as that from Pachitea.

#### 27. NECTOMYS GARLEPPI Thomas.

Fifteen specimens, as follows:

Rio Comerciato, 2,100 feet, 1 (No. 194830).

Rio Cosireni, 3,000 feet, 1 (No. 194831).

Rio San Miguel, 4,500 feet, 3 (Nos. 194832, 194834–5).

Santa Ana, 6 skins (Nos. 194906–11) and 4 in alcohol (Nos. 195111–14).

The single adult specimen of this series, No. 194830, is somewhat intermediate between *N. garleppi* and the North Peruvian *N. apicalis* Peters. I provisionally apply to it the name which is geographically most pertinent.

#### 28. ORYZOMYS KEAYSI Allen.

Thirteen specimens, as follows:

Machu Picchu, 6,000 feet, 11 (Nos. 194550, 194553, 194556, 194558–60, 194562–3, 195108–9).

Paltaybamba. 5,000 feet, 1 (No. 194883).

Santa Ana, 3,480 feet 1 (No. 195093).

29. *ORYZOMYS NITIDUS* Thomas.

Thirteen specimens as follows:

Machu Picchu, 6,000 feet, 4 (Nos. 194549, 194881-2, 194899).

Rio Cosireni, 3,000 feet, 1 (No. 194829).

Rio Comberciato, 5 (Nos. 194885-6, 194888-90).

Rio San Miguel, 4,500 feet, 2 (Nos. 194564-5).

Santa Ana, 3,500 feet, 1 (No. 194587).

30. *ORYZOMYS STOLZMANNI* Thomas.

Forty-three specimens, as follows:

Huaracondo, 11,000 feet, 1 (No. 194840).

Chospycoc, 10,000 feet, 5 (Nos. 194842-5, 194119).

Torontoy, 8,000-10,000 feet, 3 (Nos. 194842, 194847-8).

Machu Picchu, 6,000-8,000 feet, 9 (Nos. 194804-5, 194849-50, 194861, 194864, 194900-1, 195107).

Ollantaytambo, 13,000 feet, 3 (Nos. 194806, 194851-2).

Ocobamba Valley, Tocopqueyu, 9,100 feet, 1 (No. 194853).

Paltaybamba, 5,000 feet, 1 (No. 194880).

Lucma, 9,000 feet, 2 (Nos. 194865, 194891).

Rio Cosireni, 3,000 feet, 1 (No. 194884).

San Fernando, 4,500 feet, 4 (Nos. 194854-5, 194892-3).

Idma, 6,000 feet, 5 (Nos. 194856, 194858-9, 195105-6).

Huadquina, 5,000 feet, 1 (No. 194860).

La Raya Pass, 14,000 feet, 3 (Nos. 194783, 194903-4).

[Ocobamba and Callanga, Cuzco, 3 (B. M. Nos. 99.10.6.7 and 9, 98.11.6.23). O. Garlepp.]

[Marcapata, Cuzco, 1 (B. M. No. 13.2.3.12). O. Garlepp.]

31. *ORYZOMYS (MICRORYZOMYS) AURILLUS* Thomas.

1917. *Oryzomys (Microrizomys) aurillus* THOMAS, Smiths. Misc. Coll., vol. 68, No. 4, p. 1. April 10, 1917.

General color about as in *O. minutus*, much less strongly buffy than in *O. dryas*; ears longer than in either.

Fur soft, close, and woolly, as in other members of the subgenus; hairs of back about 8 mm. in length. General color above dull dark buffy ("Dresden brown"), rather clearer on sides. Under surface broadly washed with dull buffy ("tawny-olive"); the bases of the hairs dark slaty for three-fourths their length. Face rather grayer than back. Ears longer than in the other allied species, blackish, contrasting with the general color of the head. Rump generally of the color of the back, but occasionally more strongly fulvous. Hands and feet shining grayish, with more or less prominent dark metapodial patches. Tail long, finely haired, not penciled, brown, rather paler proximally below.

Skull (pl. 14, fig. 2) about as in *O. dryas*, rather more robust than in *O. minutus*.

Dimensions of the type: Head and body, 83; tail, 134; hind foot, 22.5; ear, 15.5. Skull, greatest length, 23.5; condylo-incisive length, 21; zygomatic breadth, 13; nasals, 8.2; interorbital breadth, 3.2; breadth of brain case, 11; zygomatic plate, 1.8; palatilar length, 9.7; palatal foramina, 4.2; upper molar, series, 3.

*Type*.—Adult female from Torontoy, U.S.N.M. No. 194795. Orig. No. 255. Collected May 15, 1915. "At timber line."

Sixteen specimens, as follows:

Torontoy, 9,500–14,000 feet, 8 (Nos. 194788, 194795, 194866, 194868–71, 195103).

Machu Picchu, 6,000–12,000 feet, 3 (Nos. 194872–3, 195104).

Ocobamba Valley, 9,100 feet, 5 (Nos. 194874–5, 194877–9).

After reading Mr. Osgood's remarks<sup>1</sup> about *O. dryas* and reexamining our material I came to the conclusion that this group of *Oryzomys* may very well have a special subgeneric name, and would suggest *Microryzomys*, with genotype *O. minutus*. The non-production forward to the zygomatic plate and the proportionally small molars would form the chief diagnostic characters, while, as Mr. Osgood says, the general appearance of the species shows something quite special and different from the other members of the large genus *Oryzomys*.

Within the group this Peruvian form differs from *O. dryas* by its duller color, more like that of the Pichincha *O. minutus*, and from both of those species by its longer ears.

I may record that an examination of the young type of *O. minutus* received with the Tomes collection in 1907 (B. M. 7.1.1.112) quite confirms the reference to that species of the Pichincha specimens sent us by Mr. Söderström in 1898. Young as it is, it shows the characters of *Microryzomys* in all respects.

### 32. NEACOMYS SPINOSUS Thomas.

Three specimens from San Miguel, 4,500 feet (Nos. 194838–9, 195116).

Osgood has drawn attention<sup>2</sup> to the variation from white to buffy in the belly coloration of this species, a variation repeated in a series from the Perené collection of Simons. The present specimens have white bellies, but the hairs in one are white throughout, while in the other they have slaty bases.

<sup>1</sup> Field Mus. Nat. Hist. Publ., Zool., vol. 10, p. 158, 1914.

<sup>2</sup> Idem, p. 160, 1914.

33. *PHYLLOTIS DARWINI POSTICALIS* Thomas.

Twenty-five specimens, as follows:

Huaracondo, 11,000 feet, 9 (Nos. 194566-70, 194713-4, 194716, 194777).

Chospayoc, 10,000 feet, 7 (Nos. 194571-4, 194718, 194720, 195099).

Machu Picchu, 12,000 feet, 4 (Nos. 194575-6, 194721, 195091).

Ocobamba Valley, 9,100 feet, 2 (Nos. 194578-9).

Ollantaytambo, 13,000 feet, 2 (Nos. 194577-194722).

Puquiura, 1 (No. 195110).

As usual in this group the present series shows a good deal of variation both in size and color, and some of the specimens, notably those from Chospayoc, tend to resemble the paler subspecies *limatus*, which ranges from near Lima eastward to Arequipa, whence a considerable number were sent by Simons. The type locality of *posticalis* is Galera, on the heights of the Andes west of Oroya, department of Junin.

Owing to the manner in which the collector has pulled out the base of the tail, a tendency to buffy coloration on the hinder rump appears more prominent in these specimens than in Mr. Simons's skins, but, although not mentioned in the descriptions, it is present in a variable degree in most examples of the group.

34. *HESPEROMYS FRIDA* Thomas.

1917. *Hesperomys frida* THOMAS, Smiths. Misc. Coll., vol. 68, No. 4, p. 1. April 10, 1917.

A large, comparatively long-tailed species, with the supraorbital ridges little divergent. Size about as in the largest species of the restricted genus *Hesperomys*. Fur close and fine; hairs of back about 9 mm. in length. General color of specimens in unbleached pelage grayish drab, becoming more like "wood-brown" posteriorly; in bleached pelage the posterior back may be nearly cinnamon; sides lighter and more buffy, the edge of the belly color with a more or less marked buffy line. Under surface gray, the bases of the hairs slaty, their tips grayish white. Ears rather large for this genus, colored like head. Hands and feet pure white. Tail nearly equaling the head and body in length, inconspicuously grayish brown above, white on sides and below. Mammariae 2-2=8.

Skull (pl. 14, fig. 3) shaped like that of a *Phyllotis* or of the smaller species of *Hesperomys*, the interorbital region flat, square edged, but without the broadly divergent ridges found in the other *Hesperomys* of this size. Zygomatic plate projected forward, its front edge vertical or very faintly concave; never distinctly undercut. Mesopterygoid fossa narrow.

Molars absolutely brachyodont, and thus different from the semi-hypsodont teeth of *Phyllotis*.

Dimensions of the type: Head and body, 102 mm.; tail, 91; hind-foot, 19; ear, 18. Skull, greatest length 26.7; condylo-incisive length, 24.3; zygomatic breadth, 14; nasals, 10.7; interorbital breadth, 3.8; breadth of braincase, 11.6; zygomatic plate, 3; palatilar length, 11.2; palatal foramina, 5.7; upper molar series, 3.9.

*Type*.—Adult female from Chospyoc, U.S.N.M. No. 194779. Original No. 96. Collected April 14, 1915.

Nineteen specimens, as follows:

Huaracondo, 11,000 feet, 6 (Nos. 194715, 194770, 194772, 194775-6).

Chospyoc, 10,000 feet, 8 (Nos. 194719, 194726, 194773, 194779-82).

Torontoy, 8,000 feet 1 (No. 194690).

Querafrata, 11,400 feet, 3 (Nos. 194710-11, 194723).

[Anta, Cuzco, 1, B. M. No. 3.2.9.10, O. Garlepp.]

This species differs strikingly from the other equal-sized species of restricted *Hesperomys* by the *Phyllotis*-like build of its interorbital region, the edges of which are symmetrically concave, and without the broadly divergent ridges found in *H. venustus* and its allies, and also in *Graomys*. From *Phyllotis* it is distinguished by its absolutely brachyodont molars, these being semihypsodont in that genus. When writing recently on this subject I erroneously spoke of the teeth of *Phyllotis* as brachyodont—a mistake induced by their less hypsodontism as compared with those of *Euneomys*. But they are very markedly more hypsodont than in *Hesperomys*, this being the real essential difference between the two genera.

### 35. *HESPEROMYS CARILLUS MARCARUM* Thomas.

1917. *Hesperomys carillus marcarum* THOMAS, Smiths. Misc. Coll., vol. 68, No. 4, p. 1. April 10, 1917.

Very similar to *H. carillus* of the Yungas region of Bolivia, but distinguished (1) by the general color being duller and grayer, with less buffy infusion; (2) by the upper side of the tail being, like the sides and below, quite white instead of more grayish buffy; and (3) by the palms and soles being considerably more hairy. In true *carillus* the soles, along their middle line at least, are naked almost to the heels, while in all the five available specimens of *marcarum*, taken at different seasons, the soles are hidden by the hairs to the level of the fifth or sixth sole pad.

Dimensions of the type, measured on skin: Head and body (stretched), 82; tail, 46; hindfoot, 17.7. Skull—nasals, 9; interorbital breadth, 3.9; palatilar length, 9.2; palatal foramina, 5; upper molar series, 3.7.

*Type*: Adult skin from Lauramarca, B. M. No. 3.2.9.8. Original No. 464. Collected June 25, 1899 by O. Garlepp. Presented by Oldfield Thomas.

Five specimens, as follows:

La Raya Pass, 14,000 feet, 2 (Nos. 194691-2).

[Lauramarca, Cuzco, 2 (Nos. 3.2.9. 8-9, B. M.), O. Garlepp.]

[Sucre, Cuzco, 1 (No. 3.2.9.11, B. M.), O. Garlepp.]

The specimens in the Heller collection, like most of those from La Raya Pass, are without skulls, but are clearly the same as the Cuzco examples collected by Garlepp, which I have long thought might be distinguishable from *Hesperomys carillus*. Undoubtedly the two forms are very similar, but the uniformly greater hairiness of the soles of the Cuzco series would seem to justify subspecific distinction.

36. EUNEOMYS (AULISCOMYS) PICTUS Thomas.

Forty-two specimens, as follows:

Huaracondo, 11,000 feet, 7 (Nos. 194515-6, 194518, 194520, 194526, 194717, 194777).

Ollantaytambo, Ocobamba Pass, 13,000 feet, 18 (Nos. 194527-9, 194538, 194706-9, 194774, 194977-9, 194980-6).

La Raya Pass, 14,000 feet, 16 (Nos. 194533-4, 194539, 194543, 194546, 194966-76).

This is a common and widely spread species in the highlands of Peru. In size and in the development of the ochraceous or tawny tints of the posterior body there is a very great difference between young adults and old adults; and on this account I confess to being somewhat doubtful of the difference from *E. pictus* of Osgood's "*Phyllotis (Auliscomys) decoloratus*"<sup>1</sup> from Puno, which is said to be distinguished by its smaller size and less strongly colored rump. The British Museum contains examples from two of the three localities mentioned by Osgood for *decoloratus*, and these are quite similar to normal *E. pictus* in every respect.

37. RHIPIDOMYS LEUCODACTYLUS Tschudi.

Ten specimens, as follows:

Machu Picchu, 6,000 feet, 1 (No. 194493).

Rio San Miguel, 4,500 feet, 4 (Nos. 194498-500, 195097).

Santa Ana, 3,000 feet, 1 (No. 194501).

[Ocobamba, Cuzco, 2, Nos. 98.11.6.19-20, B. M., O. Garlepp.]

[Marcapata, Cuzco, 2, Nos. 3.2.9.6-7, B. M., O. Garlepp.]

Quite agreeing with Garlepp's specimens from Ocobamba and Marcapata, Cuzco, which after seeing the type in Neuchatel, I have taken for *R. leucodactylus*, and equally distinct from the larger *R. lucullus* of Vitoc.

<sup>1</sup> Field Mus. Nat. Hist. Publ., vol. 10, p. 191, 1915.



38. THOMASOMYS AUREUS *Thomas.*

Five specimens, as follows:

Torontoy, 9,000–10,000 feet, 4 (Nos. 194817–20).

Ocobamba Valley, 9,100 feet, 1 (No. 194826).

The identity of these specimens with average examples of the somewhat variable *T. aureus* of Ecuador is remarkable. Compared with a number of specimens from the neighborhood of Pichincha they at first seem different by their more buffy belly; but not only do two examples among the Pichincha series have the same buffy belly, while two others are intermediate, but it is also of the same deep buffy in the type, which came from Gualaquiza.

The hind feet are more prominently particolored in the Torontoy set, less so in the specimen from Ocobamba, which closely matches some of the Pichincha series.

The majority of our Pichincha set are from about 7,000 feet, but one is from 12,000 feet, consequently a topotype of Allen's *T. a. altorum*, as to the validity of whose distinction from *T. aureus* I am most doubtful.

39. THOMASOMYS NOTATUS *Thomas.*

1917. *Thomasomys notatus* THOMAS, Smiths. Misc. Coll., vol. 68, No. 4, p. 2, April 10, 1917.

A medium-sized species with a dark dorsal stripe, broad feet, and well-marked metatarsal patches.

Size far smaller than in *T. aureus*, almost as in *cinereus*. Fur close, thick, rather woolly; hairs of back 6–7 mm. in length. General color above, in adults, ochraceous tawny, darker than the color so named in Ridgway; grayer on head, more tawny posteriorly; an ill-defined blackish streak down the middle of the back, from withers to rump, varying much in distinctness, but always perceptible. Under-surface soiled whitish, the hairs slaty basally, dull whitish terminally; lips and throat completely white, the hairs white to their bases. Hands above silvery whitish without darker markings on metacarpals; feet, on the other hand, only white along the edges and on the digits; the tarsus and metatarsus broadly and prominently brown. The feet themselves unusually broad for a *Thomasomys*, more as in *Rhipidomys*. Tail hairy, slightly penciled, uniformly dark brown above and below.

Skull (pl. 14, fig. 4) in general build like that of a miniature *T. aureus*, except that the zygomata are not so convergent forwards. Nasals narrow, their borders curiously sinuate, converging at their middle and then again diverging (or at least remaining strictly parallel) in their posterior third. Interorbital region narrow, its edges slightly raised to form low supraorbital ridges, similar to, though smaller than, those of *T. aureus*; the ridges scarcely extend-

ing on to the braincase—very different from the broadly divergent ridges of typical *Rhipidomys*. Zygomatic plate narrow, with vertical front edge, little projected forwards. Palatal foramina ending level with the front of  $m^1$ . Molars rather small in proportion to the size of the skull, conspicuously smaller than in the species of the *T. aureus* group.

Dimensions of the type: Head and body, 128; tail, 155; hindfoot, 27; ear, 18.5. Skull—greatest length, 33; condylo-incisive length, 30; zygomatic breadth, 17.4; nasals, 12; interorbital breadth, 4.2; breadth of braincase, 14; palatilar length, 13; palatal foramina, 7.1; post-foraminal palate, 4.6; upper molar series, 4.6.

*Type*.—Adult male from Torontoy, U.S.N.M. No. 194548; original number 173. Collected May 15, 1915.

Seven specimens, as follows:

Torontoy, 9,500 feet, 6 (Nos. 194547–8, 184894–7).

Machu Picchu, 8,000 feet, 1 (No. 194898).

From the point of view of systematic arrangement this well-marked species presents a problem of considerable difficulty; for with the general skull shape of the less typical species of the genus *Thomasomys*, it has comparatively broad feet, showing that it is a climbing animal; and it is just the broad feet which are supposed to characterize the members of *Rhipidomys*, while those of *Thomasomys*, more or less ground living, have long narrow feet. Moreover, the doubt as to its proper generic position is complicated by the fact that, while the more strongly marked species of *Rhipidomys* have broadly divergent supraorbital ridges, this can not be said of all of those which have been included in the genus.

#### 40. THOMASOMYS GRACILIS Thomas.

1917. *Thomasomys gracilis* THOMAS, Smiths. Misc. Coll., vol. 68, No. 4, p. 2.  
April 10, 1917.

A very small species allied to *T. boeops*.

Size about the smallest of the genus. General appearance very much as in *T. boeops* or a miniature *T. notatus*. Color above dark grayish buffy or clay color (approximately "Dresden brown" of Ridgway), the posterior median area usually darker, the darkening not defined enough to be called a stripe. In some specimens the color varies toward cinnamon, but it is not clear whether this variation is seasonal or individual. Undersurface soiled grayish buffy, not sharply contrasted; the hairs slaty basally, dull pinkish buff terminally. Ears fairly large, blackish, contrasting with the general color of the head; a small patch behind their lower bases pale buffy. Hands and feet with brown metapodials and light digits. Tail long, well haired, blackish brown, scarcely lighter below; the extreme tip sometimes white.

Skull (pl. 14, fig. 5) quite of the general make of that of *T. bocops*, but conspicuously smaller. Interorbital region narrow, its edges just squared, but not rigged. Brain case smooth, rounded, little ridged. Palatal foramina well open, reaching back just past the anterior end of  $m^1$ . Bullae of normal size, much smaller than in *T. taczanowskii*.

Dimensions of the type: Head and body, 82; tail, 120; hind foot, 21.5; ear, 16. Skull—greatest length, 26.1; condylo-incisive length, 22.6; zygomatic breadth, 13.6; nasals, 9; interorbital breadth, 3.7; breadth of brain case, 12; palatilar length, 10.2; palatal foramina, 5.5; upper molar series, 3.6.

*Type*.—Adult male from Machu Picchu. U.S.N.M. No. 194816. Original number 321. Collected June 8, 1915.

Twenty-one specimens, as follows:

Torontoy, 10,700–14,000 feet, 7 (Nos. 194783–5, 194789–90, 194792, 194797).

Machu Picchu, 12,000–14,000 feet, 5 (Nos. 194798, 194800, 194802–3, 194816).

Ocobamba Valley, 9,100 feet, 2 (Nos. 194807–8).

Lucma, 10,000–11,400 feet, 7 (Nos. 194791, 194810–5).

This pretty little species is readily distinguished by its small size, buffy washed belly, and the strictly normal characters of its skull; the incisors not thrown forward as in *T. daphne*, nor the bullae enlarged as in *T. taczanowskii*.

#### 41. THOMASOMYS DAPHNE Thomas.

1917. *Thomasomys daphne* THOMAS, Smiths. Misc. Coll., vol. 68, No. 4, p. 2. April 10, 1917.

A small, short-eared species, with its incisors thrown forward.

Size rather greater than in *T. gracilis*. General external appearance very much as in that animal, except that the color is duller and more drabby, and no dorsal darkening is perceptible. Color of back rather more buffy than "Saccardo's umber"; of undersurface slaty gray broadly washed with buffy, the line of demarcation not defined. Head grayer than back. Ears smaller than in *T. gracilis*; their color brown, not contrasting strongly with the head; buffy patch below outer base of ear present but not conspicuous. Hands and feet pale brown, with lighter digits; metapodial markings not strongly contrasted. Tail not heavily haired, brown above and below. One specimen with a white tip, the other not.

Skull (pl. 15, fig. 1) decidedly larger than that of *T. gracilis*, about equaling that of *bocops*. Interorbital region comparatively broad, its edges not ridged. Palatal foramina short, ending some way in front of  $m^1$  and narrow, not widely open; their median septum broadened and flattened posteriorly. Bullae small.

Incisors differing from those of every other member of the genus by being distinctly thrown forward, their angle with the upper tooth row, measured as recently described,<sup>1</sup> 84° and 85° in the two specimens, while this angle comes out at about 70°–76° in *T. gracilis* and the other members of the genus examined. Molars as usual.

*Dimensions of type*.—Head and body, 92; tail, 133; hindfoot, 23.5; ear, 16. Skull—greatest length, 27.7; condylo-incisive length, 26.2; zygomatic breadth, 14.2; nasals, 8.5; interorbital breadth, 4.7; breadth of braincase, 13; palatilar length, 12.1; palatal foramina, 5.3; post foraminal palate, 5; upper molar series (worn), 4.2.

*Type*.—Old female from Ocobamba Valley, U.S.N.M. No. 194902. Original number 521. Collected July 29, 1915.

Two specimens from Ocobamba Valley, 9,100 feet (Nos. 194809 and 194902).

As already noticed, this species is remarkable for the unusually forward set of its incisors, which distinguishes it from every other member of the genus, and probably indicates some difference in its habits, which are perhaps of a more fossorial or at least more definitely terrestrial nature.

#### 42. THOMASOMYS TACZANOWSKII Thomas.

One specimen, (No. 194876) from Ocobamba Valley.

This determination is of necessity somewhat provisional, and can only be settled when modern topotypes are available. The type has been skinned out of spirit, and is much discolored, while its ears are shrunk, as is always the case with specimens so treated. The skulls agree fairly closely, the size being about the same, the nasals similarly sinuate along their sides, as in *T. notatus*, and the bullae similarly larger than in the *T. gracilis* and the other small species to which this mouse has so strong a general resemblance.

#### 43. AKODON SURDUS Thomas.

1917. *Akodon surdus* THOMAS, SMITHS. Misc. Coll., vol. 68, No. 4, p. 2. April 10, 1917.

A large, dark-colored species allied to *A. mollis*.

Size comparatively large. Build stout and heavy. Fur rather coarse. General color above dark olivaceous gray (near "sepia" Ridgway); under surface, soiled grayish, and hairs slaty basally, dull buffy or drab terminally; line of demarcation vague.

Ears of medium size, colored like head. Hands and feet grayish brown above, the flesh of the soles blackish. Tail fairly long, finely haired, dark brown, scarcely lighter below.

Skull (pl. 15, fig. 2) solidly built, its profile evenly convex above. Muzzle thick and heavy. Interorbital region broad, its edges squared.

<sup>1</sup> Ann. and Mag. Nat. Hist., ser. 8, vol. 18, p. 302, footnote. 1916.

Zygomatic plate broad, projected forward, its front edge vertical. Palatal foramina widely open. Bullae of medium size.

*Dimensions of the type*.—Head and body, 110 mm.; tail, 80; hind-foot, 22.5; ear, 16. Skull—greatest length, 28; condylo-incisive length, 26.2; zygomatic breadth, 14.3; nasals, 10.4 by 3.8; interorbital breadth, 5; palatilar length, 12.2; palatal foramina, 6.6; upper molar series, 4.9.

*Type*.—Old male from Huadquina, U.S.N.M. No. 194663. Original No. 835. Collected October 28, 1915.

Eighteen specimens, as follows:

Idma, 6,000 feet, 6 (Nos. 194656–8, 195077, 195079–80).

Huadquina, 5,000 feet, 7 (Nos. 194661–3, 194694, 195087–9).

Paltaybamba, 5,000 feet, 1 (No. 195068).

Santa Ana, 4 (Nos. 195081–4).

This *Akodon* differs from its nearest ally, *A. mollis*, by its stouter build and smokier color, without tinge of buffy. The animal is of interest in connection with its strong external resemblance to the species here called *Microxus torques*. The two are found, respectively, at low (5,000–6,000 feet) and high (8,000–14,000 feet) altitudes and apparently represent the lowland and highland forms of northern Peru, distinguished by Osgood merely as subspecies of *A. mollis*—a closeness of relationship which, as explained below, under *Microxus torques*, I am not prepared to accept.

#### 44. AKODON BOLIVIENSIS (Meyen).

Eighty-six specimens, as follows:

Huaracondo, 40 (Nos. 194664–5, 194669, 194671–2, 194731–2, 194734–5, 194739–40, 194998–195024, 195101–2).

Chospyoc, 10,000 feet, 3 (Nos. 194673, 194742–3).

Machu Picchu, 14,000 feet, 1 (No. 194744).

Ollantaytambo, 13,000 feet, 22 (Nos. 194674–5, 194746–59, 194951–3, 194959–61).

Ocobamba Valley, 9,100 feet, 9 (Nos. 194760–4, 194962–5).

Paltabamba, 5,000 feet, 3 (Nos. 194642, 194644–5).

Lucma, 9,000 feet, 1 (No. 194646).

Chiarapata, 11,200 feet, 2 (Nos. 194697–8).

Santa Ana, 3,500 feet, 2 (Nos. 194659–60).

La Raya Pass, 14,000 feet, 3 (Nos. 194695–6, no skulls, identification not positive, 195090 in alcohol).

The common small grass mouse of eastern Peru and Bolivia.

#### [AKODON (CHALCOMYS) AEROSUS BALIOLUS Osgood].

[One specimen in the British Museum from Callanga, Cuzco. O. Garlepp. No. 98.11.6.2.]

I record this under the name given by Mr. Osgood to the Inambari form of *A. aerosus*, but do not express any opinion as to its degree of difference from true *aerosus*.

Mr. Heller did not capture any representative of the subgenus *Chalcomys*.

45. *BOLOMYS AMOENUS* Thomas.

Two specimens from Huarcocondo, 11,000 feet (Nos. 194724-5).

Type locality, Rio Colca; other specimens in the British Museum from Sangero, Department Puno, and San Anton, Titicaca.

46. *CHROEOMYS INORNATUS* Thomas.

1917. *Chroeomys inornatus* THOMAS, Smiths. Misc. Coll., vol. 68, No. 4, p. 2. April 10, 1917.

Near *C. pulcherrimus*, but ears smaller and special markings reduced.

Size and general characters about as in *C. pulcherrimus*. Color most nearly as in *C. p. cruceri*,<sup>1</sup> to which there is a strong resemblance throughout. Body a duller olivaceous gray; crown and median dorsal area suffused with dark cinnamon buff, shoulders and sides more grayish, a coloration which gives a deceptive resemblance to the members of the genus *Abrothrix*. Underside gray, the bases of the hairs broadly slaty, their tips dull whitish gray; the resulting color conspicuously less whitish and less contrasted with the general tone of the back and sides. Nose spot rich ochraceous, and this color extends on the face up to the forehead and surrounds the eyes. Ears apparently shorter than in *C. pulcherrimus*; the color of the visible parts warm brown, not contrasted with the general color of the head. Post-auricular patches comparatively very inconspicuous; the tips only of the hairs on this part grayish white, and the extent of the patches reduced, surpassed behind by the ears themselves, and widely separated from the gray on the sides of the neck. Hands white; feet with the metatarsals pale cinnamon, the digits whitish. Claws apparently less elongated than in the allied species. Tail well haired, blackish along the middle line above, pale cinnamon on sides, whitish below.

Skull (pl. 15, fig. 3) essentially similar to that of *C. pulcherrimus*, but the bullae rather smaller. The type has its incisors as strongly colored as in *Akodon*, which is not usual in *Chroeomys*, but the second specimen is intermediate in this respect.

*Dimensions of the type*.—Head and body, 122; tail, 80; hindfoot, 24.5; ear, 16.<sup>2</sup> Skull—greatest length, 30; condylo-incisive length, 27.6; zygomatic breadth, 15.6; nasals, 12.4; interorbital breadth, 5; palatilar length, 12.5; palatal foranina, 6.9; upper molar series, 4.3.

*Type*.—Adult female from Ollantaytambo. U.S.N.M. No. 194685. Original No. 457. Collected July 20, 1915.

<sup>1</sup> See Ann. and Mag. Nat. Hist., ser. 7, vol. 7, p. 186, 1901.

<sup>2</sup> Ear of other specimen measured as 18 mm.



Three specimens, all from Ollantaytambo (Nos. 194685-6, 195092).

This species is less typically *Chrocomys*-like in all the characters used to distinguish that genus from other members of the *Akodon* group; for the coloration is less abnormal, the claws are less elongated, the incisors are darker colored, and the bullae are smaller than in the hitherto known species of the genus. There is, however, no question that it is a *Chrocomys*, and that its nearest alliance is with *C. pulcherrimus cruceri*, with which it most nearly agrees in general color.

#### 47. OXYMYCTERUS PARAMENSIS Thomas.

Three specimens, as follows:

Chospyoc, 10,000 feet, 1 (No. 194699).

Ollantaytambo, 13,000 feet, 2 (Nos. 194700, 194703).

Quite indistinguishable from the typical specimens of this species which came from Choquecamate, northwest Bolivia.

#### 48. MICROXUS TORQUES Thomas.

1917. *Microxus torques* THOMAS, Smiths. Misc. Coll., vol. 68, No. 4, p. 3.  
April 10, 1917.

Like *M. mimus*, but the zygomatic plate not so strongly narrowed and slanting. Also superficially like *Akodon surdus*.

Size averaging slightly greater than in *M. mimus*. Fur close, soft, and woolly; hairs of back about 10 mm. in length. General color smoky or olivaceous gray, quite as in *M. mimus*, and also very similar to the color of *Akodon surdus*, although, owing to the softer texture of the hair, there is a difference in appearance. Under surface little lighter than upper, a vague darker streak often present in the sternal region. Ears rather short, colored like head. Hands and feet grayish brown above; soles flesh-colored, not blackish, as in *Akodon surdus*. Tail long, finely haired; brown above, scarcely lighter below.

Skull (pl. 15, fig. 4), as compared with that of *M. mimus*, very similar in most respects. Upper profile not perhaps quite so flattened in the frontal region, and therefore more approaching the even convexity found in *Akodon surdus*. Interorbital space broad, smooth, its edges scarcely squared. Zygomatic plate decidedly broader than in *M. mimus*; its front edge, although distinctly slanting, yet not so slanting as in *mimus*, and with a certain slight convexity in its upper third; this part therefore tending toward the condition found in *Akodon*. Palatal foramina well open, ending opposite the anterior third of first molar.

*Dimensions of type*.—Head and body, 102 mm.; tail, 94; hindfoot, 22.3; ear, 17. Skull—greatest length, 28; condylo-incisive length, 25; zygomatic breadth, 14.3; nasals, 10.2 by 3; interorbital breadth, 5; breadth of brain case, 12.5; zygomatic plate, 2 (1.5 in the type of

*M. mimus*); palatilar length, 11.8; palatal foramina, 6.5; upper molar series, 4.5.

*Type*.—Old male from Machu Picchu, U.S.N.M. No. 194607. Original No. 276. Collected May 28, 1915.

Fifty-eight specimens, as follows:

Torontoy, 9,500–14,000 feet, 39 (Nos. 194581–2, 194595, 194602–4, 195025–57).

Machu Picchu, 8,000–13,000 feet, 11 (Nos. 194605–8, 194610–11, 194619, 194676–7, 194693, 194745).

Ocobamba Valley, 9,100 feet, 3 (Nos. 194632–3, 194635).

Quirapata, 11,400 feet, 5 (Nos. 194647–9, 194680–1).

This species is distinguishable from *M. mimus* by its broader and less characteristically Microxine zygomatic plate, but is otherwise very similar to that animal. Osgood's *Akodon mollis orophilus* is said to be "more fulvous than *A. m. altorum*," which is anything but the case with the present animal; and his *A. m. orientalis* is a lowland form and much darker in color.

The proper treatment of this animal is a most difficult problem on account of its annectant characters. Originally two groups were known, *Akodon* with normal claws and vertical zygomatic plate, and *Oxymycterus* with elongated claws and slanting plate. Then certain species were discovered which had normal claws and slanting plate, and for these, after they had been referred either to *Akodon* or *Oxymycterus*, I formed the genus *Microxus*, with *M. mimus* as genotype. Next Mr. Osgood, getting a pair of forms, respectively lowland and highland, corresponding to the *Akodon surdus* and *Microxus torques* of the present paper, treated them merely as subspecies of a common form, *Akodon mollis*, a treatment which appears to me to give far too little value to the characters of the zygomatic plate.

But, on the other hand, I quite admit that while the zygomatic plate of the earlier described species was strongly and characteristically different from that of *Akodon*, that of *M. torques* (and I presume of *Akodon mollis orophilus* and *orientalis*) is more or less intermediate between the two. We have therefore to decide whether *Microxus* shall be amalgamated with *Akodon*, ignoring its peculiar zygomatic plate, or whether we shall recognize *Microxus* and put *torques*, *orophilus*, and *orientalis* into it, where they would form a group of species annectant with *Akodon*. Although I am by no means completely satisfied this latter course seems on the whole the most advisable for the present, and I have therefore treated Mr. Heller's animal as a member of the genus *Microxus*.

The above was written before the spirit specimens came into my hands. A study of these shows very strongly the essential difference

between the two animals under discussion. The long head, especially the long muzzle, and the small eyes, give the *Microtus* quite a different aspect to that of the *Akodon* with its blunt snout and normal eyes, and I now feel no hesitation in considering them as belonging to different genera.

49. *DASYPROCTA KALINOWSKII* Thomas.

Adult female, No. 194485, Pumachaca, Urubamba Valley, 5,000 feet. Taken by E. C. Erdis.

The second known example of this striking species. The specimen is in more faded pelage than the type, but agrees with it in all essential respects, though the yellow of the belly is rather less strongly marked.

[*DASYPROCTA VARIEGATA* (Tschudi).]

[Three specimens in the British Museum from Callanga, Cuzco. Nos. 98.11.6.10–12. O. Garlepp.]

[*LAGOSTOMUS CRASSUS* Thomas.]

[A skull, the type, in the British Museum from Santa Ana, Cuzco. No. 97.10.3.16. J. Kalinowski.]

Like the *Abrocoma* described by Mr. Eaton, this Peruvian Vizcacha is no doubt now extinct. The skull was found buried in the sand.

50. *VISCACCIA SATURATA* Thomas.

Seven specimens as follows:

Ollantaytambo, 13,500–14,000 feet, 4 (Nos. 194466–9).

Between Puquiura and Huadquina, 14,000 feet, 3 (Nos. 194479, 194481, 194483).

The Puquiura Pass specimens agree absolutely with the typical series of *V. saturata*, while those from Ollantaytambo are a little lighter, and tend to approach the palid form *V. arequipae*.

51. *VISCACCIA AREQUIPAE* Thomas.

One specimen, female, from La Raya Pass, 14,000 feet (No. 194478).

52. *CAVIA TSCHUDII TSCHUDII* Fitzinger.

Three immature females from La Raya Pass, 14,000 feet (Nos. 194490–2).

[Four specimens in the British Museum from Urubamba, Cuzco, 9,000 feet, Nos. 3.2.9.13–16. O. Garlepp.]

The La Raya Pass specimens have grayish bellies, while those from Urubamba are buffy below, but the former are all immature.

53. *ODOCOILEUS PERUVIANUS* Gray.

Six specimens as follows:

Ollantaytambo, 3 males and 1 female (Nos. 194300, 104304-5, 194299).

Chospyoc, Huaracundo, 1 male (No. 194301).

Paso Panticalla, 1 female (No. 194306).

54. *MAZAMA AMERICANA WHITELYI* Gray.

Female, Uvini, Rio Cosireni (No. 194308).

This is clearly Tschudi's *Cervus rufus*, but on geographical grounds it may be provisionally considered as subspecifically distinct from the Guianan and Brazilian form, to which that name, synonymous with *americanus*, properly belongs.

The type skull of Gray's *Coassus whitelyi*, however (B. M. No. 73. 6. 27. 2), coming quite from this region, appears to me to be referable to this larger Brocket, and not, as Lydekker has placed it, to the smaller *Mazama tschudii*, the *Cervus nemorivagus* of Tschudi.

Unfortunately that type skull is without skin and quite young, while Mr. Heller's example is old, and we have no Peruvian specimens connecting the two. An absolute identification must therefore await further material.

The hairs on the nape of this specimen are not reversed, and the skull measures 204 mm. in condylobasal length; tooth-series (worn) 63 mm. The anterior palatine foramina are no less than 37 mm. in length.

55. *MAZAMA*, species.

Imperfect skull of a male from Santa Ana, 3,480 feet (No. 194307). Collected by E. C. Erdis.

This skull (found on ranch of, and presented by, Alberto Duque) consists only of the frontals and brain case, without teeth, and is not certainly determinable. It seems, however, to indicate the presence in this region of a small *Mazama* of the *rufina-bricenii* group, as it appears too small to belong to *M. tschudii*, at least if that species is really as large as *M. simplicicornis*, of which it is said to be the Peruvian representative.

56. *HIPPOCAMELUS ANTISIENSIS* D'Orbigny.

Male and female from Ollantaytambo, 14,000 feet (Nos. 194298, 194303).

57. *LAMA HUANACHUS CACSILENSIS* Lönnberg.

Two males from La Raya Pass, 16,000-17,000 feet (Nos. 194292, 194294).

All the guanacos of the highlands of Peru and Bolivia may apparently be distinguished from those of Chile and Patagonia by

their smaller size, as gauged by the skull length. Professor Lönnberg's name *cacsilensis*, from the plateau of Cacsile, Nunoa, quite near La Raya Pass, is available for them.

The broadly rounded choanal opening of the palate, so striking in Lönnberg's figure of the type of *cacsilensis*, proves to be a character quite untrustworthy. For while the guanaco usually has a narrow V-shaped opening, and the vicugna a broad rounded one, the British Museum contains specimens forming exceptions to the rule in both the species, and I therefore consider the type of *cacsilensis* to be another such exception.

In color there is less difference between *cacsilensis* and true *huanachus* than appears to be the case in the corresponding races of the vicugna.

The type locality of *huanachus* may be taken as Quillota, Chile, the only exact locality mentioned by Molina. In this region that author states that during the winter the guanacos come down from the mountains into the plains.

Sexual difference in these animals is well marked in the sizes of the incisors and canine teeth, so that skulls can be sexed at a glance.

#### 58. LAMA VICUGNA MENSALIS Thomas.

1917. *Lama vicugna mensalis* THOMAS, Smiths. Misc. Coll., vol. 68, No. 4, p. 3. April 10, 1917.

Size slightly less than in true *vicugna* and teeth much smaller. Color more strongly fulvous.

The type locality of Molina's *Camelus vicugna* should apparently be taken as "the part of the Chilean Cordillera facing the Provinces of Coquimbo and Copiapo," and an example in the British Museum from Catamarca may provisionally be said to represent that animal; for the chain of the Andes could be no barrier to a vicugna, so that the forms of the eastern and western slopes would no doubt be the same.

From Peru and Bolivia quite a number of specimens are available, and as compared with the Catamarca specimen these all agree in having a slightly shorter skull, with shorter muzzle and nasal opening, and much smaller teeth, the combined length of the upper molars being usually well under 50 mm. (45 in the type, 44 and 45 in Lönnberg's two specimens), while the length in the Catamarca *vicugna* is 54 mm. The general color of the northern form is a strong cinnamon-tawny, the light underside white and sharply contrasted, while in the specimen of true *vicugna* the color is a colder and more grayish brown, somewhat like "avellaneous" of Ridgway. In this respect Mr. Heller's specimen is less characteristic than usual, duller and browner than in any others of the series of *mensalis* available. No doubt therefore considerable variation will be found to occur in the

color where series of the forms are collected, and there will be some intergradation in the dimensions of the skull and teeth.

The northern form may therefore be considered as a subspecies of the southern and may have the above name applied to it.

The chief skull dimensions of the Catamarca specimen and of the type of *mensalis* are, respectively, as follows: Greatest length, 244 and 240; condylobasal length, 225, 224; greatest breadth, 122, 123; nasal opening, 92, 87; palate length, 116, 111; length of molars, 54, 45.

*Type locality*.—Incapirca, Zezioro, Junin, Peru; altitude, 17,700 feet. Other specimens in the British Museum from the Puna region, Peru (E. P. Ashmore), Cordillera, north of Titicaca, 17,000 feet (Maj. H. S. Toppin), Choquecamate, Bolivia (P. O. Simons), and "Bolivia" (T. Bridges).

*Type*.—Male adult. British Museum No. 97.10.3.18. Collected May 30, 1890, by J. Kalinowski.

Male and female from La Raya Pass, 16,000 feet (Nos. 194296-7).

#### 59. OROLESTES INCA Thomas.

1917. *Orolestes inca* THOMAS, Smiths. Misc. Coll., vol. 68, No. 4, p. 3. April 10, 1917.

*Generic characters*.—Like *Coenolestes*, but proportions of teeth different. Externally quite as in *Coenolestes*.

Skull (pl. 15, fig. 5) very like that of *Coenolestes*; zygomata broader and more flattened, especially anteriorly, where the height is some five or six times greater than the thickness. In *Coenolestes* the bar more nearly approaches the cylindrical, its thickness being from a half to three-quarters the height. Anteorbital vacuities present, as in *C. obscurus*. Opening of anteorbital foramina slightly further back, over the anterior third or middle of the first molariform tooth.<sup>1</sup> Palatal foramina and vacuities quite as in *Coenolestes*. Lower jaw without special peculiarities, though the two rami are perhaps less extensively in contact, and are in consequence less firmly united.

Teeth similar in number to those of *Coenolestes*, the formula, as I should now read it, being I.  $\frac{4}{3}$ ; C.  $\frac{1}{1}$ ; P.  $\frac{4}{4}$ ; M.  $\frac{3}{3} \times 2 = 46$ .

Upper incisors as in *Coenolestes*, except that the fourth is narrower, more pointed, and in fact more like a premolar than the third, and stands a little way back from it, while in *Coenolestes* it is similar to and stands close behind the third.<sup>2</sup> Canines short, scarcely or not longer than incisors, double-rooted, premolariform in shape, quite unlike the long, single-rooted, normally-shaped canines of

<sup>1</sup> M<sup>1</sup> of the Catalogue of Marsupials and of my original description of *Coenolestes*, p. 4 as I now consider it should be reckoned.

<sup>2</sup> The figured skull of *Coenolestes*, as then explained, was abnormal in this respect.



*Coenolestes*. First premolar minute, perhaps one fifth to one tenth the bulk of the second, its tip not or barely as high as the cingular cusp of the canine; in *Coenolestes* the first and second premolars are subequal, sometimes one and sometimes the other slightly the larger.  $P^3$  (the sector or  $pm^4$  of the catalogue) of about the same size as in *Coenolestes*, its thickness transversely subequal anteriorly and posteriorly, while in *Coenolestes* it is thicker behind than in front, as is more usual in marsupials generally. Molariform teeth ( $p^4$  and molars) as in *Coenolestes*, the minute  $m^3$  perhaps averaging even smaller.

Lower teeth more like those of *Coenolestes* than is the case with the upper, but there is a corresponding, though slighter, reduction in the relative size of the posterior incisors, the canine and anterior premolars.

As a genus this animal is most readily distinguishable from *Coenolestes* by the shortening and the double-rooted condition of the upper canines, and the reduction in the relative size of  $p^1$ .

*Specific characters*.—Externally hardly distinguishable from *Coenolestes fuliginosus*, being of the same size and proportions, and of the same dull grayish-brown (near "clove-brown") color above, *C. obscurus* being more strongly brown in tone, though this difference may possibly be due to the fading of the specimens of the latter. Undersurface paler brown, the ends of the hairs drabby brown; in *C. fuliginosus* the ends of the belly hairs are dull grayish white. Ears with a narrow rim of whitish or glossy hairs, this whitish rim not perceptible in the specimens of *Coenolestes*. Hands and feet brown on metapodials, lighter on digits. Tail averaging about the length of the head and body, thinly haired, either uniformly dull brown or slightly mottled with dull whitish.

Skull and teeth as described above.

Dimensions of four specimens: Male 194401 (type), head and body, 120; tail, 108; hindfoot, 22; ear, 15. Male 194381, head and body, 122; tail, 113; hindfoot, 22.5; ear, 15. Female 194397, head and body, 106; tail, 104; hindfoot, 21.5; ear, 15. Female 194398, head and body, 105; tail, 125; hindfoot, 22.5; ear, 15.

Skulls of male and female, the first the type: Greatest length, 33, 31.4; condylobasal length, 32.5, 31; zygomatic breadth, 14.8, 14.8; nasal length, 17.5, 15.6; intertemporal breadth, 7.8, 7.8; breadth of brain case, 12.4, 12; palatal length, 19, 18; palatal foramina, 7.3, 7; upper tooth series, 18.3, 17.5; combined length of three anterior molariform teeth ( $p^4$  to  $m^2$ ), 5.4, 5.3; lower tooth series, 17. 16.6; length of  $i_1$ , 5.2, 4.9; three anterior lower molariform teeth, 5.8, 5.8.

*Type*.—Adult male from Torontoy. U.S.N.M., No. 194401. Original No. 248. Collected May 14, 1915.

Seventeen specimens as follows:

Torontoy, 9,500–14,000 feet, 7 (Nos. 194381–2, 194386, 194391, 194397–8, 194401).

Machu Picchu, 12,000–13,000 feet, 6 (Nos. 194415–16, 194418, 194420–1, 194428).

Ocobamba Valley, 9,100 feet, 4 (Nos. 194429, 194431–2, 194434).

This animal is the prize of the collection and really represents a most interesting discovery. Specimens of the family *Coenolestidae* are still exceedingly rare in collections, and even if the present series had been referable to the original genus *Coenolestes*, they would have been of great value. And this is of course still more the case now that they prove to represent a second genus of this archaic group.

The recent specimens of the *Coenolestidae* as yet known are as follows:

The type of *Hyracodon fuliginosus* Tomes, Ecuador, B. M. No. 7.1.1.191. A young specimen preserved in spirit. This historic example, described in 1863, was not accessible when I wrote my paper on *Coenolestes* in 1895.

Two skins (one skull only) from Gualea, Ecuador, collected in 1914 and presented by W. Goodfellow, Esq., B. M. Nos. 15.11.25.5–6. These undoubtedly represent true *fuliginosus*, and are of particular value, owing to the type's age and condition rendering it useless for any close comparison.

Four specimens from La Selva Estate, Bogota. Collected in 1895 by an Indian in the employ of Mr. G. D. Child. B. M. Nos. 96.1.7.1–3, and American Museum of Natural History No. 10559, the latter being the basis of Miss Dederer's paper on the genus (1909). The original series of *C. obscurus*, of which B. M. No. 96.1.7.1 is the type.

Eleven specimens of *C. obscurus* from the Paramo de Tama, head of the Tachira River, Colombia and Venezuela. Collected by W. H. Osgood in February and March, 1911, and referred to by him, with the promise of a subsequent paper on the subject, in the account of his expedition.<sup>1</sup> Now in the Field Museum of Natural History, Chicago.

Finally the series of *Orolestes inca* from Peru.

When describing *Coenolestes obscurus* I distinguished it from *C. fuliginosus* mainly by size, but as Tomes's type proved to be young, there was until recently nothing to show whether the two species were or were not distinct. Now, however, I am able to state, on the evidence afforded by Mr. Goodfellow's specimens, that *C. obscurus* has rather larger teeth than *C. fuliginosus* (first three molariform teeth 6.2 instead of 5.5 or less); that it is grayer and less brown in

<sup>1</sup> Field Mus. Nat. Hist., Publ., vol. 10, p. 38, 1912.

color above, exactly as in *Orolestes inca*, washed with grayish white below, instead of brown; and, finally, that it is distinguished from both the other members of the family by the anteorbital vacuities being filled in with bone. In the young specimen, the type, there is still a narrow unossified cleft between the outer corners of the nasals and the maxillae, but in the adult specimen even this is almost completely closed up.

The very great sexual difference in size between our two adult specimens of *C. obscurus* is noteworthy (male skull 36.3, female 32.5), this being considerably greater than in *Orolestes*, but whether it is constant I do not know, nor have I material to state what is the corresponding difference in *C. fuliginosus*.

In accordance with the latest conclusions of the paleontologists who have written on the subject, I am now quite prepared to admit that *Coenolestes* and its allies should be reckoned as more related to the Polyprotodonts than to the Diprotodonts.

60. *DIDELPHIS MARSUPIALIS ETENSIS* Allen.

A young male from Santa Ana, 3,000 feet (No. 194373).

61. *DIDELPHIS PARAGUAYENSIS PERNIGRA* Allen.

Seven specimens as follows:

Chospayoc, 10,000 feet, 2 (Nos. 194358-9).

Torontoy, 2 (Nos. 194360-1).

Machu Picchu, 3 (Nos. 194367-8, 194370).

While most of the specimens hitherto obtained in southern and southeastern Peru have been in the black phase, these specimens, curiously enough, are with one exception in the gray phase, with the dorsal piles white. They thus exactly resemble average specimens of *D. p. andina*, the opossum of Ecuador and North Peru.

62. *METACHIRUS NUDICAUDATUS TSCHUDII* Allen.

Adult female, Rio Cosireni, 3,000 feet (No. 194376).

63. *PHILANDER LANIGER ORNATUS* Tschudi.

Adult female, Rio Comerciato, 2,000 feet (No. 194375).

With well-marked postauricular gray lines, these, like the median patch on the foreback, appearing to be individually variable. Of three specimens from the Upper Marañon, one has them and two have not.

[*MARMOSA RAPPOSA* Thomas.]

[A female and four young in the British Museum from Vilcanota River, Cuzco. Nos. 98.11.16.13-17, the adult the type. O. Garlepp.]

64. *MARMOSA IMPAVIDA* Tschudi.

Adult male, Torontoy, 8,000 feet (No. 194378).

The examination of this specimen, with its really white under-surface, has made me revise the determination of our small Peruvian *Marmosae*. This character had not previously been observed in any Peruvian species, but now Mr. Heller's specimen corresponds so closely with Tschudi's description, both in this and other respects, that it should certainly be regarded as *impavida*. In consequence, the specimens from Chanchamayo and Marcapata that I had previously called *impavida*, as also those from Yurimaguas, so named by Mr. Osgood with my connivance, need redetermination. On the whole it appears to me that they may suitably be called *M. noctivaga* Tschudi, a form which I had wrongly assigned to *M. cinerea*, but whose type I have since seen in Neuchatel and have taken a measurement of its teeth, which closely correspond with those of the Chanchamayo examples.

The skull and teeth of *M. impavida* are markedly smaller than those of *noctivaga*, agreeing in fact very nearly with those of *M. quichua*, the latter being distinguishable mainly by its cream-buffy throat and chest and broadly slate-based belly hairs with buffy fawn-tips.

Even on the white undersurface of Mr. Heller's specimen there is an unsymmetrical area on the side of the chest where the hairs are slaty gray at base, but this is obviously an individual variation.

[*MARMOSA QUICHUA* Thomas.]

[A specimen in the British Museum from Ocobamba, Cuzco. No. 98.11.6.18. Type. Collected by O. Garlepp.]

65. *PERAMYS PERUVIANUS* Osgood.

Two males from Ocobamba Valley, 9,100 feet (Nos. 194379-80).

These two specimens, caught in the same place on successive days, differ remarkably in color, but agree in so many essential characters that they must, I think, belong to the same species. No. 194379 is grayish above, anteriorily, while 194380 is more uniformly brown, and very like *P. adustus*; but the former is very old, with worn teeth, and the grayness is probably due to senility. Then also 194379 has the buffy abdominal patches described in the type, while, like *P. adustus*, 194380 is without them. This again, however, may be an age characteristic—a point which further material can alone elucidate.

The British Museum possesses no *Peramys* from Peru, the two deteriorated examples described by Osgood being the only Peruvian examples of the genus on record.

The skulls of both the present specimens are unfortunately broken to pieces, and it is only possible just to compare the size and wear of the molar teeth.

EXPLANATION OF PLATES.

PLATE 14.

(All figures approximately natural size.)

- FIG. 1. Skull of *Holochilus incarum* Thomas. No. 194915, U.S.N.M. Type. See p. 226.
2. Skull of *Oryzomys (Microroryzomys) aurillus* Thomas. No. 194796, U.S.N.M. Type. See p. 228.
3. Skull of *Hesperomys frida* Thomas. No. 194779, U.S.N.M. Type. See p. 230.
4. Skull of *Thomasomys notatus* Thomas. No. 194548, U.S.N.M. Type. See p. 233.
5. Skull of *Thomasomys gracilis* Thomas. No. 194816, U.S.N.M. Type. See p. 234.

PLATE 15.

(All figures approximately natural size.)

- FIG. 1. Skull of *Thomasomys daphne* Thomas. No. 194902, U.S.N.M. Type. See p. 235.
2. Skull of *Akodon surdus* Thomas. No. 194663, U.S.N.M. Type. See p. 236.
3. Skull of *Chrocomys inornatus* Thomas. No. 194685, U.S.N.M. Type. See p. 238.
4. Skull of *Microxus torques* Thomas. No. 194607, U.S.N.M. Type. See p. 239.
5. Skull of *Orolestes inca* Thomas. No. 194401, U.S.N.M. Type. See p. 244.



1. HOLOCHILUS INCARUM.



2. ORYZOMYS AURILLUS.



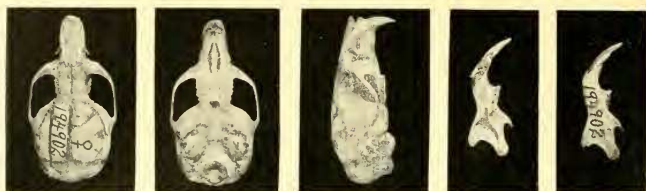
3. HESPEROMYS FRIDA.



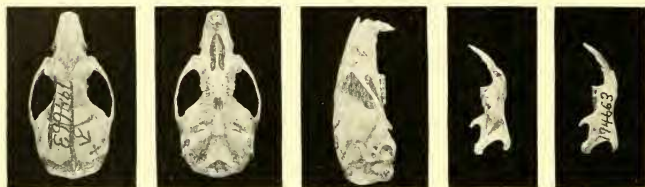
4. THOMASOMYS NOTATUS.

5. THOMASOMYS GRACILIS.  
SKULLS OF PERUVIAN MAMMALS.





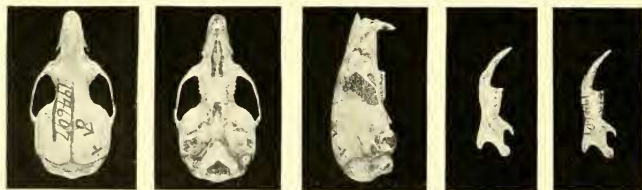
1. THOMASOMYS DAPHNE.



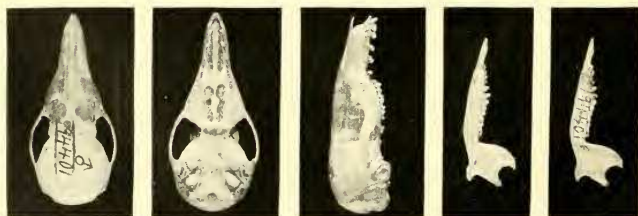
2. AKODON SURDUS.



3. CHROEOMYS INORNATUS.



4. MICROXUS TORQUES.



5. OROLESTES INCA.

SKULLS OF PERUVIAN MAMMALS.